Before the

Federal Communications Commission

Washington, D.C.

In re:	)	
2000 Biennial Regulatory Review –	)	
Streamlining and Other Revisions of	)	
Part 25 of the Commission's Rules	)	IB Docket No. 00-248
Governing the Licensing of, and	)	
Spectrum Usage by, Satellite Network	)	
Earth Stations and Space Stations	)	
	)	
Sixth Report and Order and Third Further	)	
Notice of Proposed Rulemaking	)	

Comments of National Programming Service, LLC
On Third Further Notice

National Programming Service, LLC ("NPS"), through counsel, herewith submits its Comments in response to the Commission's Sixth Report and Order and Third Further Notice of Proposed Rulemaking in IB Docket No. 00-248, released March 15, 2005 (FCC 05-62).

Introduction

NPS is a preeminent C-Band video programming provider. Established in 1986 (almost 20 years ago), NPS currently provides service to approximately fifty percent (50%) of the C-Band universe of customers (100,000 NPS customers) – primarily

homes, but also other entities. C-Band revenue of NPS, in the millions of dollars, represents almost ninety percent (90%) of NPS's revenue. NPS currently employs some 130 employees, almost all of whom work in the C-Band service area of NPS. Should the FCC issue a flat ban on continued analog transmission/reception, or couple a ban with a relatively short transition period, NPS estimates that up to 90% of its revenue, as well as 100,000 customers/American public, would be adversely impacted! Based on public policy and technical considerations, as supported by the two Technical Studies/Statements attached to NPS's Comments, there is no good reason to adopt or press this concept forward by government fiat.

C-Band customers, primarily in rural or non-cable TV areas, rely on NPS and C-Band itself to receive vital video news, information, and entertainment programming. These citizens have a collectively huge investment in their analog receivers – receivers that are estimated to have a substantial additional life span.

Some 50 satellite channels are currently transmitted in analog mode, while only some 23 are transmitted in digital mode.

With virtually 24 hours x 7 days per week operations on each of these channels, this represents some 8,400 hours of analog programming in any given month! Percentage-wise, elimination of these analog transmissions (as the Commission proposes in draconian fashion (Notice, at paras. 84-88), would represent some **68%** of total C-Band video transmissions by channel – by any account, significant – indeed, way over one half of all C-Band video transmissions!

Issues of Concern to NPS & the Satellite Industry in General

FCC Off-Axis Operational Proposal:

In its lengthy Third Further Notice, the FCC directs virtually all its attention to resolution of technical issues related to VSAT and off-axis transmission, so as to reduce/eliminate perceived – but undocumented interference potential with elliptical C-Band earth stations and off-axis EIRP requirements.

As KDM points out in its attached Technical Showing, any alleged interference is not caused by analog transmissions. Rather, as KDM emphasizes, "This is not an issue off-axis EIRP with analog services; rather, it is a lack of knowledge and experience of individual personnel operating transmission

facilities." Comsearch, in its attached Technical Showing, also notes that analog is not a source of interference – rather, if there is any interference, it is invariably digital.

Further, even the FCC concedes that if new off-axis EIRP envelopes were required of analog video transmissions, the alleged problem would be solved!

> "Such requirements should be sufficient to prevent analog video transmissions from causing harmful interference to other licensed stations, but still allow analog video licensees to complete their links with the satellites with which they are communicating." (Notice at para. 86, although technical study support is requested by the FCC for even this given.)

The attached Technical Showing of KDM essentially dispels this Commission concern and finds that the concern is misplaced, at best. While NPS would be willing to support such an off-axis requirement, if this means significant operational changes and additional expenses, NPS questions why those should be incurred when there is no significant counterbalancing reason why, and would have to oppose such costly changes.

Proposed Flat Ban/Prohibition of Analog C-Band Transmissions/Reception:

Almost gratuitously, or as an afterthought, the Commission then proposes for the first time to eliminate analog C-Band transmissions. (Notice at paras. 84-88; paras. 87-88 in particular; pp. 32-33) This, under the guise that "analog transmissions are more susceptible to harmful interference from other transmissions and more likely to cause harmful interference to other transmissions." (Notice at p. 33, para. 87)

Again, both KDM and Comsearch, in their respective attached Technical Showings, note that it is not analog transmissions/reception that might be causing alleged interference problems – rather, digital is more susceptible to being a potential root cause of perceived interference. Hence, why blame analog and propose a flat prohibition on analog transmissions/reception?

The Commission has cited no empirical evidence to back up its claim as to potential for interference and even more telling, cites no actual instance of interference among C-Band transmitters/receivers. Indeed, it would be difficult to do so given that C-Band satellite dishes are by nature fairly large (on the order of 3 meters/10 feet), vs. VSAT or DBS dishes and the very

nature of analog transmission/reception vs. digital transmission/reception is such that their characteristics have far different interference potentials – digital being much more susceptible to perceived interference than analog. (See attached KDM and Comsearch Technical Showings.)

C-Band analog technology has been in existence for well over 20 years – well before digital and no parties utilizing analog technology have had any reported problems to which the Commission cites. To NPS's knowledge, no one has even raised this alleged interference issue/efficiency of spectrum as a potential issue of some import which the Commission should address.

If anything, there is more potential for interference from digital transmissions and with digital reception (not caused by analog transmissions). (See attached Technical Showings prepared by KDM, and Comsearch – the leading frequency coordination company that has been involved with satellite coordination/interference issues ever since the inception of the satellite industry.)

Alternate C-Band Phasing Out Proposal

While NPS recognizes the continued movement towards conversion from analog to digital transmissions/reception, there should be no rush by the FCC to accelerate such transition when there is no good reason to interfere with the natural market place and anticipated replacement over the next several years of analog with digital receivers. As in other services – going all the way back to the introduction of broadcast color TV and HDTV – the Commission, if it is determined to transition out C-Band analog, should allow a reasonable/practical/realistic time table to effect this change. NPS would also point out that the Commission required – and still does require – TV set manufacturers to allow both black & white and regular NTSC signals to pass through color and HDTV sets. The HDTV requirement and analogy is particularly apropos here with respect to allowing continued transmission/reception of analog C-Band signals for the foreseeable future – while existing paid for consuming public and service providers' equipment is still viable.

Alternate Sunset Proposal

Alternatively, if the Commission is determined to sunset C-Band analog transmissions/reception – despite the utter lack of any evidence that such is needed or even appropriate given the Commission's sparse, unsupported reasoning, NPS submits that based on the existing market place situation, at least a ***ten (10) year*** transition period from date of adoption of final Rules to this effect is appropriate. This ten year transition/sunset period (vs. the one year proposed in the Notice, para. 88), is far more reasonable and less arbitrary and capricious than the Commission's current proposal.

Again, no one is clamoring for a flat out immediate ban of analog video transmissions/reception in the C-Band. Rather, NPS, having consulted with various other providers/users of this technology, has yet to come across any entity that feels strongly that the FCC should ban these transmissions. Rather, virtually all of them feel just the opposite – i.e., let the market place determine the need for transition to digital.

The FCC has taken great pride over the last few decades in letting the market place determine technological developments/transitions, only requiring that industry <u>not</u> leave

its customers/U.S. citizens in the lurch and force them to have to replace communications equipment prematurely. NPS submits that just as strong a case for continued authorization of analog video C-Band operations is present here.

WHEREFORE, NPS respectfully requests that the Commission not impose any restrictions on analog transmission/reception of domestic video satellite signals. Alternatively, NPS requests that the Commission allow for a period of at least ten (10) years from the date the release of a Final Order to transition over to an all digital environment.

Respectfully submitted,

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Dated: September 6, 2005

September 2, 2005

Technical Showing in Support of National Programming Service, LLC (NPS)
Comments in Response to FCC Third Further Notice of Proposed Rulemaking
IB Docket No. 00-248

Based on Comsearch's experience over the years, the interference environment at C-band TV receive-only earth stations may be such that while performance is acceptable for analog reception, degradation is noted upon conversion to digital reception. The challenge is that the reception of the digital signals from the satellites requires a much cleaner interference environment. For reception at C-band (3700 – 4200 MHz) the typical interference criterion for analog modulation may be –144 dBW/MHz, while the typical interference criterion for digital reception is –156 dBW/MHz. The reception of the digital compressed video signals will normally take place at sites the broadcasters have been using for years to receive analog video. Many of these sites may have been coordinated and protected, and although they were determined to be suitable for analog reception, they may not be suitable for digital reception because the interference criterion for digital reception is lower than for analog reception.

Comparison of Interference Criteria for FM-TV and Digital TV

The traditional method for analyzing the effects of interference into FM-TV has involved determining the maximum permissible level of interference power at co-channel operation and further considering the offset of the terrestrial carriers versus the satellite carriers. The maximum permissible interference power level is calculated as a function of carrier-to-interference ratio. Through experimentation and analytical methods the carrier-to-interference (C/I) required for broadcast quality FM video is 25 dB. The interference objective for most satellite television broadcast and CATV earth stations receiving FM television at 4 GHz was based upon this required C/I and the received signal level as calculated below:

Maximum Permissible Levels of Interference Analog FM-TV at C-band		
Satellite Downlink EIRP	34.0	dBW
Gain of 4.5m Receive Antenna	44.0	dBi
Free Space Loss	-196.4	dB
Received Satellite Signal Power	-118.4	dBW
Required Carrier-to-Interference Ratio	25.0	dB
Max. Permissible Level of Interference	-143.4	dBW/MHz

For digital video, or digital systems in general, the long term interference objective is set to provide a C/I ratio necessary to degrade the carrier-to-noise (C/N) ratio by not more than 0.5 dB, or 10 dB below the thermal noise floor. A sample calculation is shown below:

Maximum Permissible Levels of Interference Digital Video TVRO at C-band		
Satellite Downlink EIRP	25.0	dBW
Gain of 4.5m Receive Antenna	44.0	dBi
Free Space Loss	-196.4	dB
Received Satellite Signal Power	-127.4	dBW
Digital Signal Noise Bandwidth	8.0	MHz
Digital TVRO System Noise Temperature	150.0	K
Receiver Thermal Noise Power Level (kTB)	-137.8	dBW
Downlink Carrier-to-Noise Ratio	10.4	dB
Received Satellite Signal Power Density	-136.4	dBW/MHz
Receiver Thermal Noise Power Density	-146.8	dBW/MHz
Max. Permissible Level of Interference	-156.0	dBW/MHz
Resulting Carrier-to-Noise-Plus-Interference Ratio	9.9	dB

Broadcasters attempting to determine potential interference sources into C-band downlinks typically looked at 4 GHz terrestrial microwave as the interference suspect on their operator's checklist. These days, more often than not, terrestrial microwave is not the source of interference, if there is any interference, for these satellite downlinks. Experienced field engineers have documented in-band sources of interference from cellular, PCS, pagers, and UHF transmitters, military and FAA radars, and aircraft Radar altimeters. The effects of interference on digital downlinks is much more than the occasional sparkles experienced on analog downlinks. Interference is manifested as full freeze frame or a blank screen for the digitally delivered video carrier vs. none of this for analog delivered/received C-Band video and associated audio signals.

For digital transmission, less signal power is available from the satellite because it is necessary to operate the transponders at backed-off power levels. At earth stations, lower power levels result in operation closer to the receiver thermal noise power level, and therefore greater sensitivity to interference than analog. Thus in setting interference objectives for earth

station receivers, while there may be enough link margin to accept some threshold degradation caused by interference for analog transmission, this degradation is no longer acceptable for digital transmission.

The complete switch from Analog to Digital in C-band earth stations and the resulting benefits of bandwidth savings and picture quality do not come without the possible hidden threat of interference problems in today's congested environments. It is a sensible move to evaluate previous analog only receives sites to see if they will be compatible with the stringent interference criterion required for C-band digital reception, prior to the switch over from analog to digital C-band operation.

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September 2, 2005

Technical Showing in Support of National Programming Service, LLC (NPS) Comments in Response to FCC Third Further Notice of Proposed Rulemaking IB Docket No. 00-248

At a recent PanAmSat User's conference the issue of C-Band analog satellite transmission/reception was a topic of extensive discussion. The satellite carriers along with the majority of multi channel carriers are fighting this battle and there is significant opposition to doing away with analog C-Band satellite service. This FCC proposal is totally inappropriate timing in the transition from analog to digital distribution/contribution for a change of this significance. This transition has been underway for the past five years and within the next decade we will see 95% of all programming with satellite delivery in digital format.

We have seen satellite interference cases since there were two satellite and more than two transmission facilities. **This is not an issue off-axis EIRP with analog services; rather, it is a lack of knowledge and experience of individual personnel operating transmission facilities.** In the majority of the cases it is not an analog carrier but a digital that might be causing an initial interference problem. Speaking from the distribution of programming services, upon the initiation of an analog service the satellite carriers coordinate the transponder against adjacent satellites (other carriers) as well as polarities and then the service is active for years with no change in parameters needed. The vast majority of interference comes from malfunctioning equipment and untrained

personnel. At one point in our satellite history anyone who operated satellite transmission equipment had to at least have a General Class FCC License. Education is the key to illuminating interference not forcing the industry to drop analog services.

As a technical satellite consultant for Oxygen, Hallmark Channel and The Outdoor Channel I was tasked with converting their services to digital satellite delivery. While on the surface a push to all digital appears to reclaim bandwidth and reduce recurring transponder cost that is not always the case. In the three mentioned services only one reduced these requirement from a full transponder to a portion of a transponder. So when we speak about reducing operating cost this is far from the case. If you consider a programming channel that is delivered into 100% of all cable homes there are approximately 10,000 cable headends. For this programmer they would have to provide 10,000 satellite decoders at a price of $900 per unit,; that is $9,000,000 before marketing expenses and that is in addition to on going costs for a full transponder that they may or may not be able to utilize!

If this change is mandated, very few programmers could make this transition within the one year proposed time frame. The broadcast community has requested time after time to extend the deadline for DTV transition and has been granted by the FCC such extensions initially. While there is some difference in the broadcaster transition, some of the same issues with a transition of this significance remain for satellite delivery/reception. While the DTV transition reclaims needed spectrum these changes have an overriding, potentially very negative impact on the general public! This proposal does not serve the best public interest.

The day the last analog service is shut off we will still see the same level of interference cases. Therefore, banning analog C-Band satellite transmissions/reception or not allowing a reasonable conversion period (suggested as 10 years), is not the solution!

Kelly D. Miller
President

Kelly D. Miller, President of KDM Satellite Solutions
KDM Satellite Solutions has been an independent consultant firm providing distribution solutions for domestic and international programmers since 1997. Prior to establishing his business Kelly Miller worked as Director of Telecommunication and Distribution for Fox Sports Net and Fox Sports International. Responsibilities included managing Fox's global transponder capacity, contracting transmission facilities, implementing compression

technology and sub-leasing excess satellite and fiber capacity to entities worldwide. Kelly Miller has also managed teleport facilities and has owned and operated Ku and C band transportable uplink units. His experience and knowledge across both engineering and operations of ground based facilities and his involvement in space craft loading supports his expert opinion in this matter.